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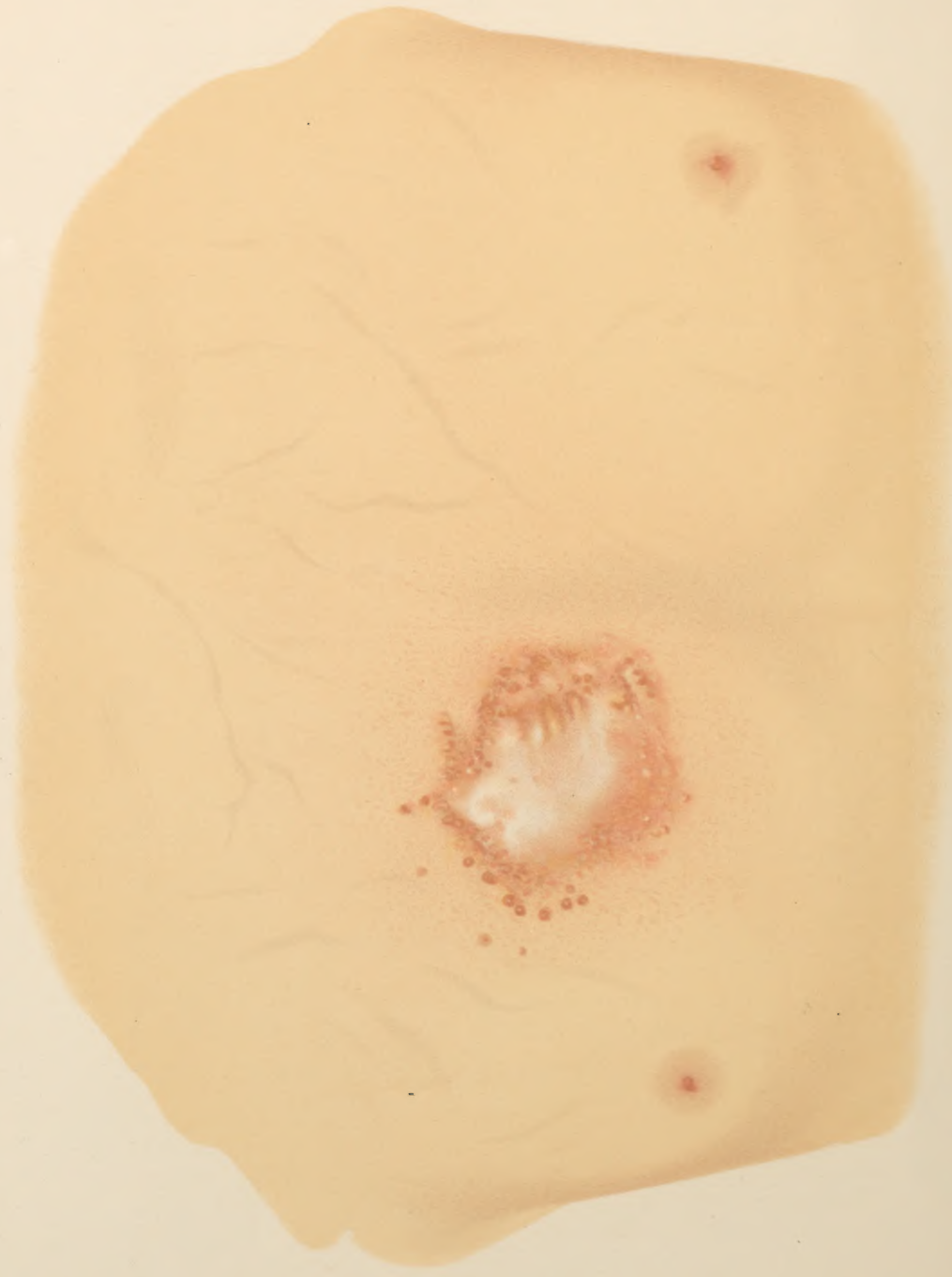
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DR. RANSOM'S CASE OF LUPUS VULGARIS.



## OBSERVATIONS ON AN UNCOMMON FORM OF CUTANEOUS TUBERCULOSIS.\*

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IN December, 1892, the subject of this paper was first brought to me for treatment, and the case presented so many peculiar and unusual features that I deemed it of sufficient interest to report.

The patient, Kate R., aged nine years, is the fourth child and only daughter of a family of seven children, four of whom are still living and are strong and robust.

Of the three dead, one died of diphtheria; one from fracture of the skull, a result of accident; and the third at one and a half years of age from cerebro-spinal meningitis. The family history is as follows:

The maternal great-grandmother died of dropsy, cause unknown; the maternal great-grandfather died of apoplexy; the maternal grandfather died from chloral poisoning. The maternal grandmother is still living, is about sixty years of age, and, except for chronic rheumatism from which she is a great sufferer, is in good health. The mother is strong and hearty, and is able to do the housework and sewing for the entire family. The paternal grandfather died at an advanced age from some acute disease; was sick only a few days. The

\* Read before the New York Society of Dermatology and Genito-Urinary Surgery.



paternal grandmother is still living and is nearly ninety years of age. She is a large woman and perfectly well. The father is a large, healthy man, weighing over two hundred pounds, and has never been sick.

The patient is a pale, thin child, who, the mother says, has always seemed more delicate than any of the other children, though she has never had any severe illness.

When I first saw her, in December, 1892, the mother gave the following history of the trouble:

About three months ago the child came in from play and complained of a lameness in the right arm. Upon examination the mother found a small lump in the right axilla, and at the same time noticed a small red pimple on the right side of the chest. The lump was somewhat tender on pressure, and the mother poulticed it for several days, and then took her to a physician, who ordered an ointment. The little pimple on the chest in the meantime grew larger, and soon other small spots appeared about the original lesion. They were in no way troublesome, there being absolutely no sensation of any kind accompanying them, and but for their unsightly appearance would never have been noticed. Gradually these spots disappeared and others came in the same place, the tendency being to increase in number.

Upon examination I found the condition as follows: On the upper part of the chest, about one inch above the level of the nipple and just on the right border of the sternum, is a more or less circular patch with irregular outline. (See colored plate.)

The center of the patch is somewhat depressed below the level of the surface, and has a smooth, glistening appearance like cicatricial tissue. The color of the center is faint red or purplish (a lavender tint like that of lichen planus). Around the border of the patch are groups of pinhead-sized papules in various stages of development and involution. The newer papules are slightly elevated and surmounted by a little whitish scale which is rather adherent. The color of the papules is a dark red, giving to the border of the patch a brownish-red color. The older papules when, looked at closely, have a yellowish-red color and seem to contain a yellowish fluid, but have not the characteristic apple-jelly appearance of the ordinary tubercle of lupus. Scattered about among these papules are isolated pits or cicatrices of the same character and color as the center of the patch. There are absolutely no subjective symptoms. In the right axilla is an enlarged gland about one inch in diameter, firm to the touch and without any tenderness. I ordered vaseline for a placebo and kept the case under observation throughout the winter. During this time many of the



papules disappeared and new ones developed at the periphery, some of them as far as half an inch from the original patch.

From my observation I concluded that the case must be one of cutaneous tuberculosis, but of a peculiar type, and my impressions were strengthened by the report of an unusual case of tuberculosis of the skin made by Dr. W. Dale James and Norman Walker, of Edinburgh, which was sent me by Dr. Walker about this time, in which many of the clinical features described were similar to my own case. In December, 1893, I excised a portion of the growth and submitted it to Dr. Ira Van Gieson for microscopical examination. In Dr. Van Gieson's report of this examination, as will be seen, he found many factors which made it impossible, from the microscopical examination alone to confirm the diagnosis of tuberculosis, and he suggested animal inoculation as a means of determining the point.

During the following summer (1894) the papules comprising the patch entirely disappeared, no new ones recurring; and about the same time the enlarged gland in the axilla softened and spontaneously ruptured. At the present writing (June, 1895) there has been no recurrence of either. On the site of the lesions there is a white, glistening, and smooth scar with small white cicatrices about the borders, the sites of the isolated lesions. The child is growing, and, while she is somewhat pale and delicate-looking, she seems to be perfectly well.

*Dr. Van Gieson's Report of the Microscopic Examination and Inoculation Experiments.*—The microscopical examination of the excised bit of skin left the question of diagnosis as determined solely by the structure of the tissue quite doubtful. The structure of these small nodules on the breast partook of the characters of both tuberculosis and syphilis in the form of miliary gummata. The minute structure of these little nodules was quite uniform in their various stages of development, but the picture under the microscope was not the classical one of miliary tubercles or the other phases of tuberculosis. These nodules in the excised portion were not only somewhat atypical structurally, but their grouping and distribution were rather different from the lesions of the ordinary cases of cutaneous tuberculosis. Thus, the nodules were deficient to a considerable extent in the usual elements of necrosis, diffuse tubercle tissue, vascular lesions, and secondary inflammations. Furthermore, their occurrence in more or less discrete masses, and their very superficial situation in the skin, complicated with the formation of tiny bullæ, made the grouping and arrangement of the nodules in the layers of the skin rather extraordinary and quite different from the usual forms of primary or secondary cutaneous tuberculosis.



The rather characteristic feature of primary tubercular lesions of the skin is the focal situation of the tubercular nodules; they are grouped together in a confluent mass, with more or less cheesy degeneration, diffuse tubercle tissue, surrounding exudative inflammation, so that a single ulcer of more or less extent results. The nodules in such cases also may be quite deeply situated. In a tubercular dactylitis, for instance, most of the nodules with their single or confluent cheesy areas may lie very deep in the thickness of the corium or subcutaneous connective tissue. Nodules of such uniform size, occurring so individually and superficially in the skin as in this instance, are certainly quite different from the ordinary run of cases, and the contrast between them and the lupous class of cases is too striking to need more than mere mention. Cutaneous tuberculosis distributed in this unusual way must be of rather infrequent occurrence; at least, no such case has come into this laboratory during its twenty years' existence. Finally, with the most patient searching, no tubercle bacilli could be demonstrated.

On the other hand, judging from their minute structure alone, the nodules in this case could not be distinguished from miliary gummata, such as are occasionally distributed through one or more organs.

Thus it will be seen that not a few factors made it very difficult, from microscopical examination alone, to pronounce these nodules, even with the clinical history, positively tubercular. The clinical features would incline the diagnosis by the microscope toward primary tuberculosis, for no history of hereditary or acquired syphilis could be obtained, and the single enlarged axillary gland on the same side seemed to be more suspicious of tuberculosis than syphilis.

In view of some of these unconventional features of the distribution of the nodules, as well as the structural difficulties in the way of a positive diagnosis, the case was thought to be an exceedingly practical one to settle the question by animal inoculation. Incidentally, Woodhead's article (*Journal of Pathology*, 1893) on the determination of doubtful cases of tuberculosis by animal inoculations, and Hodenpyl's observations (*Transactions of the New York Pathological Society*, 1893) on the differential diagnosis of miliary tubercles and gummata by the microscope, are of interest in this connection.

Accordingly, three guinea-pigs were inoculated from this patient, under strict antiseptic precautions, on May 22, 1894. A piece of skin about four millimetres in diameter containing two papules was excised from the breast; two of the pigs were inoculated in the middle of the belly, and a third in the belly with a portion of one papule and in the axilla with a portion of the second papule.



One of the guinea-pigs died sixteen days after the inoculation, with absolutely no traces of tuberculosis at the autopsy. The point of inoculation had completely healed and the organs were perfectly normal. The other two animals were killed forty-three days after inoculation, and both showed a pronounced development of general subacute tuberculosis. The lungs, spleen, and mesenteric glands were involved more or less extensively by yellowish cheesy nodules from one half to four millimetres in diameter. The bronchial glands and spleen were especially affected, the former being enormously enlarged and cheesy, and the latter was completely riddled with the yellowish, cheesy nodules. Microscopical examination demonstrated tubercle bacilli, in considerable numbers in these viscera and also in the liver. The kidneys and suprarenal bodies were normal. In one of the animals no trace of the point of inoculation could be found; in the other an ulcer with a soft, cheesy, partially encapsulated floor on the left side of the belly one inch below the ensiform cartilage marked the site of the inoculation.

Having confirmed the tubercular nature of the papules in this case by animal inoculations, we may go on with a more detailed description of their structure. Sections of the excised piece of skin show that the peculiar papules and vesicles are situated over tiny masses of tissue which have grown into the upper portions of the corium, and consist of giant cells surrounded by clusters of rather large polymorphous cells, which in turn are irregularly enveloped by groups of quite small round cells. Thus there are giant cells in the centers of the nodules; then come the polymorphous or epithelioid cells; and finally, at the periphery of the nodules, where the nodules abut against the surrounding skin structures, are the irregular clusters of small round cells. As has been noted before, the nodules are very uniformly situated, quite superficially (Figs. 1, 2); and, further, they show comparatively little tendency to become confluent or form masses of any considerable size. Fig. 1 gives a very good average idea of the isolated character and superficial situation of these nodules. There is almost an entire absence of necrosis or cheesy degeneration in the slightest degree in these nodules, and they simulate very perfectly the miliary gummata.

The drawings fail to show perfectly how these nodules depart somewhat from the classical structure of miliary tubercles; without employing the colors of the section it is exceedingly difficult to show this, or the way that the nodules coincide with the structure of miliary gummata.

The relation which these small nodules bear to the formation of the papules and vesicles described by the clinician is made plain by the study of two stages in the development of this process of inocula-



tion, shown in Figs. 1 and 2. The vesicles are formed by the progressive accumulation of an exudation, principally of serum, from the tubercular nodules, which lifts up the rete Malpighii from the corium, and distends it in the form of a little conical pouch of fluid. The source of the exudation and the direction it takes are readily understood if we consider the general sequence of events dependent upon the lodgment of tubercle bacilli in a tissue or organ. After the lodgment of the bacilli there are first mitosis and proliferation of the surrounding connective-tissue cells as an expression of the body substance of the bacilli acting as a chemical irritant. Then in the course of time occurs an exudative inflammation from vessels just outside the ball of pro-

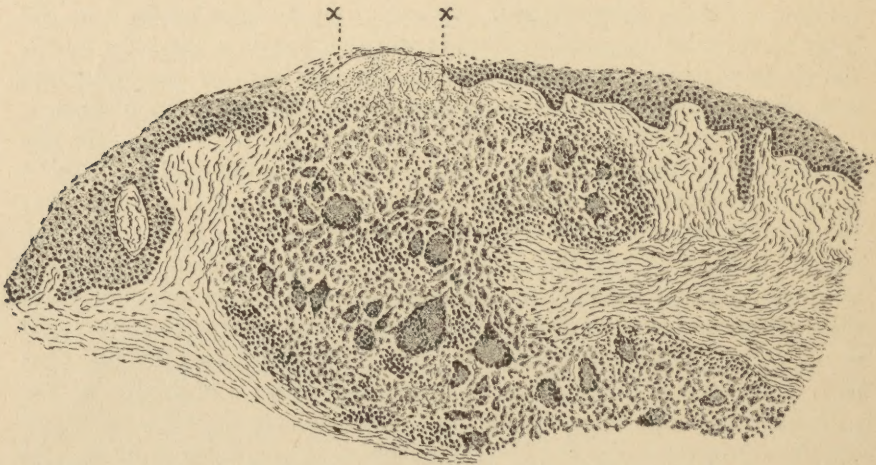


FIG. 1.—An early stage of the formation of a vesicle produced by the miliary tubercles in the skin. One of the isolated miliary tubercles with its central giant cells, epithelioid cells, and irregular clusters of peripheral small round cells lies just beneath the rete Malpighii. The rete is elevated by a mass of fibrin and red blood-cells at *xx*.

liferated connective-tissue cells about the bacilli. An army of leucocytes comes forth with more or less fibrin, serum, and red blood-cells, and surrounds the young tubercles. But in this instance, the tubercles being surrounded and constrained by the dense wall of connective tissue in the corium, the exudation is directed toward the outlet of least resistance, and thrusts up the epidermis in the form of these vesicles.

An early stage of the vesicle formation is seen in Fig. 1. Here is one of the small isolated tubercles situated in the pars papillaris and upper corium, and just above the nodule the epidermis is slightly raised by a mass of exudation products. This exudation consists partly of fluid, but principally of red blood-cells, held in the meshes of





FIG. 2.—A final stage in the vesical formation. The epidermis is elevated in an abrupt cone above a cup-shaped disk (cc) of confluent miliary tubercles, and between the two is a mass of granular material (bb) or clear serum coagulated by the alcohol hardening. aa, clusters of desquamated oedematous degenerated rete cells soaked off in the serous contents of the vesicle. f, hair follicle. c, sweat glands. d, a more deeply situated miliary tubercle.

a fibrinous network. Beneath the layer of exudation at *x x* there is a very slight degeneration and indistinctness of the cells of the tubercle.

Later stages of vesicle formation take place in the same way, the exudation becomes more excessive, and the elevation of the compressed and stretched rete becomes correspondingly greater. A later, rather ultimate, stage of the vesicular formation is shown in Fig. 2. The skin is here involved by several miliary tubercles joined together in a single layer, which is still quite circumscribed and very superficially situated just beneath the epidermis.

The rete Malpighii, compressed, stretched, and partially degenerated, is raised up in an abrupt moundlike form of some considerable height (three fourths of a millimetre) by an excessive accumulation of fluid (*b b*) above the circumscribed bed of confluent miliary tubercles beneath (*c c*). Only extremely slight evidences of necrosis or cheesy transformation can be found in the bed of tubercular tissue beneath the vesicle. Thus it appears that the granular material (*b b*) pouching out the epidermis has not been furnished by the breaking down of the tubercular tissue, but that this material is a fluid exudation coagulated in the hardening medium (alcohol). The exudation here, then, seems to be of the same source and character as in the smaller vesicles in Fig. 1, except that it must have had a clear or pale appearance, for the fibrin and preponderance of red blood-cells noted in the earlier vesicle are completely absent.

Joining the clinical aspects and pathological history of these papules and vesicles together, when miliary tubercles follow this particular mode of growth in the skin—viz., very superficial situation, scattered and circumscribed distribution, little tendency toward necrosis—the origin and course of development of the vesicle would seem to be somewhat as follows:

Shortly after the tubercle bacillus lodges in the skin there should be a tiny lump just beneath the epidermis. Later, after the element of exudation has come into play, as in the stage in Fig. 1, the nodule would become more prominent, a trifle raised, and reddish. A thin, transparent spot in the epidermis at the summit of the nodule should show the color of the red blood-cells in the exudation beneath. Thus the first stage of the vesicle would be produced by gradual augmentation of the exudation; then, with a decrease in red blood-cells and an increase in serum, a tiny, circumscribed, straw-colored or clear herpetiform blister would finally result and correspond with Fig. 2. Eventually, in the history of these vesicles, should they rupture or should the roof be removed, a minute raw depression would result, which in



healing should for some time leave a little scarred pit or pearly colored spot in the skin.

Very little can be said, however, about stages in the history of the papules beyond the phase of complete vesicle formation, as shown in Fig. 2, or about the healing processes, for the excised part has furnished hardly any material for such study.

In one or two places, however, the appearances in the sections might be regarded as indicative of the reparative process which takes place after the culmination of the vesicles. Fig. 3, for example, shows

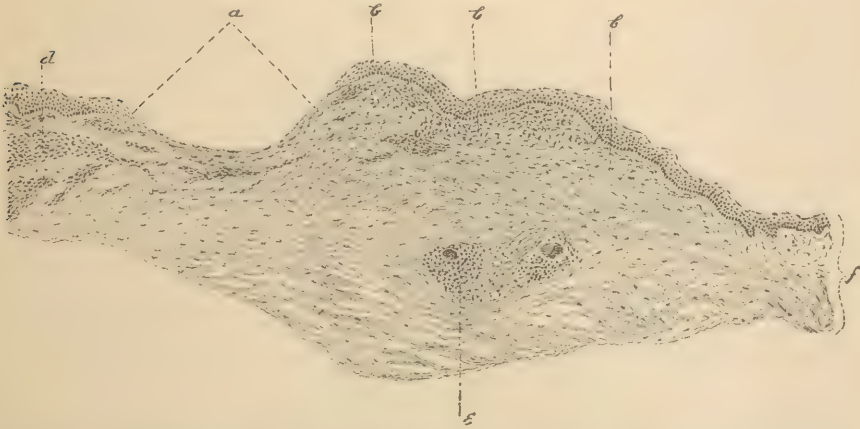


FIG. 3.—A section which shows a small depression, *a*, and beside it a thickened portion of the skin. The derma in both regions is changed into a denser structure, *b b b*. *d*, infiltration of elongated cells just beneath the rete Malpighii. *e*, atrophic tubercle. *f*, normal skin.

a little pit in the skin where the epidermis is either partially absent or has a thinned, desiccated, degenerated appearance, and the corium beneath is exceedingly compact and fibrous. In this changed corium beneath the pit the distinction between the loosely arranged upper papillary portion of the derma and the denser corium beneath, as in the normal skin at *f*, is entirely lost; the two layers of the corium are merged together in a single compact layer, not unlike some phases in the development of scar tissue. On the right of the pit (*b b b*) the whole substance of the corium is thickened, so that the surface of the skin is slightly elevated at this point, and the derma, except in its very lowermost strata, is again of quite dense structure, with the distinction between the papillary and lower derma obliterated. Just beneath the rete Malpighii the derma is infiltrated with irregular-shaped, mostly elongated cells (*b b b*). These cells seem to be proliferated connective-tissue cells, possibly fibroblasts producing, under a reparative rôle, new

connective tissue which has thickened this region. The same sort of cells are seen to the left of the pit at *d*.

Near the center of this thickened portion of the skin is a tubercular nodule consisting of two giant cells, each surrounded by a few small round cells. This particular nodule is quite different from the others; it is not so completely developed, it seems shrunken, the giant cells are degenerated and vacuolated, and altogether the impression is presented that the nodule is undergoing retrogression—that it is being walled in or replaced by connective tissue. This shrunken appearance of this particular nodule is not due to the contingency of its having been cut off the edge of a larger, well-developed mass, for nearly the same appearance is presented throughout a number of sections.

While the characters of such sections, as illustrated in Fig. 3, seem to indicate some stages of the healing process of the vesicles or the retrogression of the tubercles, it is possible that an entirely different explanation may account for these changes. The changes in this set of sections may possibly be of an artificial character. The operation of seizing the skin by forceps in the excision may have compressed the skin at *a*. The corium may have been squeezed together so as to present a very dense appearance under the microscope, and a portion of the compressed corium may also have been thrust out laterally so as to thicken and change the structure of the skin at *b b b*. In this way the increased density and obliteration of the upper and lower layers of the corium may possibly be accounted for. Similarly the tubercle at *c* may have been modified in its structure.

In view of such possibilities of artificial origin, and the limited material for study, nothing positive can be said of the reparative stages, or phases subsequent to the culmination of the vesicles in this case.

A final glance at Fig. 2 shows very graphically how readily tuberculosis might be acquired from these vesicles scattered about so superficially in a region of the skin. An exceedingly small portion of the papules sufficed to inoculate the guinea pigs. Yet such a patient is no more dangerous than the other tuberculous individuals who disseminate the disease through less tangible, more insidious channels.

Judging from the literature, very little seems to be known about this peculiar form of tuberculosis of the skin. It must be either of very rare occurrence, or is probably confused with other forms of cutaneous lesions.

The structure and distribution of these tubercles in the skin, although over a limited area are quite identical with the variety of tubercle in acute miliary tuberculosis. Yet, of course, the tubercles in this case



are in no wise a manifestation of acute miliary tuberculosis. The tubercles are simply of the miliary grade of size, and are scattered about discretely over the limited portion of the skin, and, being thus situated on the surface of the body, the inflammatory products associated with the tubercles seek an outlet on the surface of the skin in the vesicles or herpetiform elevations. It is also impossible in a single case like this to speak with any certainty about the source of the tubercle bacilli, or how they have traveled about in the skin to correspond to this occurrence of the miliary form of the tubercle and their distribution in discrete nodules, which is so contrary to the usual forms of cutaneous tuberculosis. It would seem, however, in this case that these nodules were of primary origin about the region of the nipple, for the child was perfectly healthy in other respects. The enlarged axillary gland of the same side might be regarded as secondarily infected from the nodules on the breast. Apparently the only other case described of this kind is reported by James and Walker (*An Unusual Case of Tuberculosis of the Skin*). In this case, a girl, nineteen years old, the minute nodules occurred in groups and traveled about, so that in the course of a year five different regions of the skin were involved. No mention is made of any signs of tuberculosis elsewhere than on the skin. The nodules were not uniform in all the different regions; a group on the cheek, about an inch and a half in diameter, had a deep purple tint, brownish toward the center. Under a magnifying glass this portion of the skin was involved by a series of soft, round, brownish-yellow nodules arranged in the shape of an oval ring. Some of the nodules had a minute white spot in them, as if they were minute cysts on the point of bursting. The eruption on the legs was rather different—the nodules were much larger and their surfaces very slightly depressed. On the forearms and hands the maculæ were of the chronic chilblain type. The group on the cheek seems quite identical with the collection of nodules on the breast described in our case. Nodules from the neck and just below the knee, in James and Walker's case, were examined microscopically. The several micro-photographs, however, illustrating the histological portion of the paper of these writers are so thoroughly unrecognizable that it is very difficult to obtain any clear conception of the rather diffuse and involved description of the histological examination.

By a process of exclusion Walker concludes that the nodules are tubercular, although somewhat atypical in structure. He was also unable to find tubercle bacilli in the sections. In looking over the literature the authors find their case almost unique, with the exception of the forms described by Leloir (*Journal des maladies cut. et syph.*, vol. ii,

p. 193) under the term lupoma. Leloir gave the name to a particular form of lupus, and furthermore distinguished varieties such as lupoma elevatum, planum, or sclerosis. In these cases of Leloir, James and Walker find the only coincidences with their own case.





